Selecting a Network

You can configure your system for information exchange between a range of devices and computing platforms, and operation systems. Use the table below to help you select a network.

Network Selection Criteria

If your application requires	Choose this network	Select this communication / device
• High-speed data transfer between information systems and/or a large quantity of controllers • Internet/Intranet connection • Program maintenance	EtherNet/IP	• SLC 5/05 Processor, or • 1761-NET-ENI EtherNet Interface • 1761-NET-ENIW Web-Enabled EtherNet Interface
• High-speed transfer of time-critical data between controllers and I/O devices • Deterministic and repeatable data delivery • Program maintenance • Media redundancy or intrinsic safety options	ControlNet	• 1747-KFC15 ControlNet Messaging Module • 1747-SCNR ControlNet Scanner Module • 1747-ACN15 and -ACNR15 ControlNet Adapter Modules
• Connections of low-level devices directly to plant floor controllers, without the need to interface through I/O devices • More diagnostics for improved data collection and fault detection • Less wiring and reduced startup time than traditional, hard-wired systems	DeviceNet	• 1747-SDN DeviceNet Scanner Module • 1761-NET-DNI DeviceNet Interface Module
• Plant-wide and cell-level data sharing with program maintenance	Data Highway Plus (DH+)	• SLC 5/04 Processor
	DH-485	• 1747-KE DH-485/RS-232C Interface • SLC 5/01, 5/02 or 5/03 Processor with a 1747-AIC Isolated Link Coupler • SLC 5/01, 5/02 or 5/03 Processor with a 1761-NET-AIC Advanced Interface Converter • 1747-UIC USB to DH-485 Interface Converter
• Connections between controllers and I/O adapters • Distributed controllers so that each has its own I/O communications with a supervisory controller	Universal Remote I/O	• 1747-SN Remote I/O Scanner • 1747-BSN Backup Remote I/O Scanner • 1747-ASB Remote I/O Adapter • 1747-DCM Direct Communication Module
• Modems • Messages that send and receive ASCII characters to/from devices such as ASCII terminals, bar code readers, message displays, weight scales, or printers	Serial	• SLC 5/03 Processor • SLC 5/04 Processor • SLC 5/05 Processor • SLC 5/01, 5/02, or 5/03 Processor with a 1747-KE DH-485/RS-232C Interface

Ethernet Network

The TCP/IP Ethernet network is a local-area network designed for the high-speed exchange of information between computers and related devices. With its high bandwidth (10 Mbps to 100 Mbps), an Ethernet network allows many computers, controllers, and other devices to communicate over vast distances. An Ethernet network

ControlNet Scanner I/O Control Capabilities

I/O Platform	Discrete	Analog
1793	✓	✓
1794	✓	✓
1797	✓	✓

ControlNet Adapter Modules

The 1747-ACN15 and -ACNR15 modules enable up to three 1746 chassis of I/O modules to produce/consume scheduled I/O on the ControlNet network. Both modules are compatible with all 1746 discrete, analog, and specialty I/O, except those requiring G-file configuration, such as the 1747-SN and 1747-BSN modules. The 1747-ACN15 and ACNR15 modules consume 0.9A at 5V dc.

The ControlNet Adapter Modules feature:

- optional media redundancy via dual BNC connectors (1747-ACNR15).
- individual connection to single modules or chassis connections to groups of discrete modules.
- ability to upgrade firmware via ControlFlash.

The table below indicates with a "✓" which ControlNet controllers can communicate to the 1747-ACN via scheduled messaging.

ControlNet Adapter Communication Capabilities

Scheduled Messaging	1747-SCNR	1771-PLC5C	1756-Lx via 1756-CNB	1784-KTCS
1747-ACN(R)15 Discrete I/O	✓	✓		✓
1747-ACN(R)15 Analog I/O	✓	✓		

DeviceNet Network

The DeviceNet network is an open, low-level communication link that provides connections between simple industrial devices like sensors and actuators to high-level devices like controllers. Based on standard Controller Area Network (CAN) technology, this open network offers inter-operability between like devices from multiple vendors. A DeviceNet network reduces installation costs, startup/commissioning time, and system or machine downtime.

The DeviceNet network provides:

- inter-operability – simple devices from multiple vendors that meet DeviceNet standards are interchangeable.
- Common network - an open network provides common end-user solutions and reduces the need to support a wide variety of device networks.
- Lower maintenance costs – replace devices without disrupting other devices.

1747-UIC Universal Serial Bus to DH-485 Interface Converter

This device allows a computer with a USB port to interface to DH-485 ports on an SLC 500, MicroLogix, or other Rockwell Automation controllers and on PanelView terminals. The 1747-UIC features a USB connector as well as both an RS-232 and an RS-485 port. Use the RS-232 port to connect to SLC 5/03, 5/04, 5/05 (Channel 0), MicroLogix, CompactLogix, FlexLogix, ControlLogix, PanelView 300 or higher, or AIC+. Use the RS-485 Port to connect to SLC 5/01, 5/02, 5/03 (Channel 1), PanelView 300 or higher, or 1747-AIC.

USB to DH-485 Interface Converter Specifications

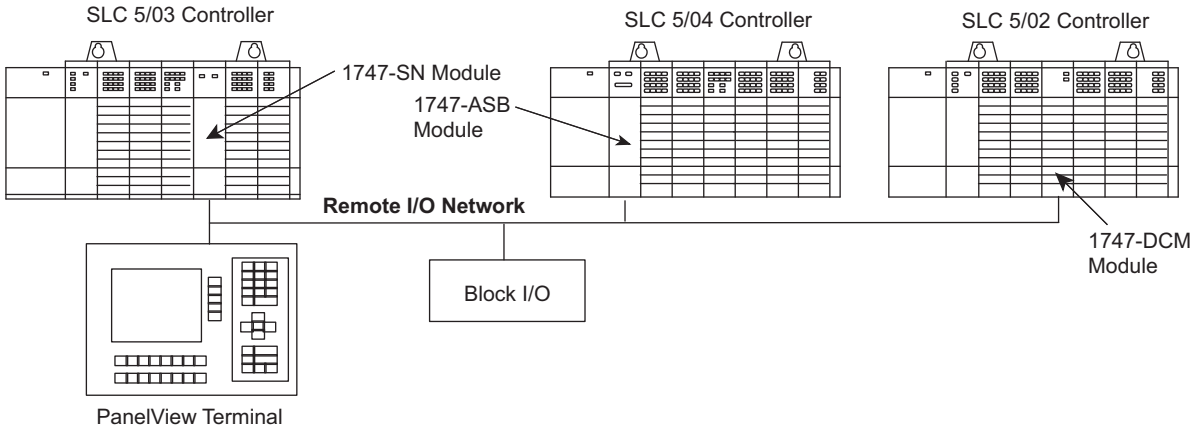
Attribute	1747-UIC
USB power consumption	<100 mA (low power)
USB speed	USB 1.1 (12 Mbps)
DH-485 Baud Rate	19.2 Kbps

Universal Remote I/O (RIO) Network

The strength and versatility of the Universal Remote I/O network comes from the breadth of products it supports. In addition to 1746 I/O, the Universal Remote I/O network supports many Allen-Bradley and third-party devices.

Typical applications range from simple I/O links with controllers and I/O, to links with a wide variety of other types of devices. You connect devices through remote I/O adapter modules or built-in remote I/O adapters. Using the Universal RIO Network instead of direct-wiring a device over a long distance to a local I/O chassis reduces installation, start-up, and maintenance costs by placing the I/O closer to the sensors and actuators.

SLC 5/03, 5/04, and 5/05 processors support pass-thru which lets you configure RIO devices remotely from an Ethernet, DH+, or DH-485/DF1 network, as well as block transfer instructions for faster reading and writing of I/O data.



Universal Remote I/O Connectivity for SLC 500 is provided by the following interfaces:

- 1747-SN Remote I/O Scanner
- 1747-BSN Backup Remote I/O Scanner
- 1747-ASB Remote I/O Adapter
- 1747-DCM Direct Communication Module

RS-232/DF1 Port Splitters

Remote I/O Scanner Module

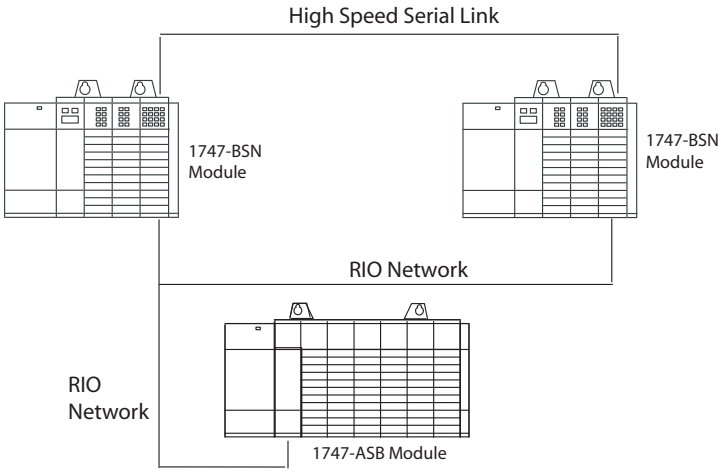
The 1747-SN module provides high-speed remote communication between an SLC processor and Allen-Bradley operator interface and control devices. The scanner provides connectivity of your SLC 5/02 or higher processor to devices such as InView Message displays, Power Monitor 3000, PanelView, 1791 Block I/O, Allen-Bradley Drives, 1746 I/O, 1771 I/O, and Flex I/O devices.

Note: The series B scanner supports block transfer of up to 64 words of data.

The 1747-SN features:

- noise immunity over various cable distances via selectable baud rates.
- distribution of devices over a wide physical area, supporting RIO cable lengths up to 3050 m (10,000 ft).
- connection of up to 16 devices in normal mode or 32 devices in complementary mode.
- capability to send large amounts of data to RIO devices without affecting system throughput, utilizing block transfers.
- capability to download and change applications in PanelView terminals and Power monitors via remote I/O passthru.

Backup Scanner Module



Remote I/O Device Specifications

Remote I/O Device Catalog Numbers and Specifications

Catalog Number	Description	Backplane Current (mA) @ 5V
1747-SN	Remote I/O Scanner Module	600 mA
1747-BSN	Backup Scanner Module	800 mA
1747-ASB	Remote I/O Adapter	375 mA
1747-DCM	Direct Communication Module	360 mA

Remote I/O Device Catalog Numbers and Specifications

Baud Rate		Maximum Cable Distance	Terminating Resistor Size
Using Extended Node Capability	57.6 K baud	3048 m (10,000 ft)	82Ω 1/2 W
	115.2 K baud	1524 m (5000 ft)	82Ω 1/2 W
	230.4 K baud	762 m (2500 ft)	82Ω 1/2 W
Not Using Extended Node Capability	57.6 K baud	3048 m (10,000 ft)	150Ω 1/2 W
	115.2 K baud	1524 m (5000 ft)	150Ω 1/2 W
	230.4 K baud	762 m (2500 ft)	82Ω 1/2 W

Serial Network

The SLC 5/03, SLC 5/04, and SLC 5/05 processors have a serial port which is configurable for RS-232 compatible serial communication. Use the serial port to connect to devices that:

- communicate using DF1 protocol, such as modems, communication modules, programming workstations, or other Encompass partner devices.
- communicate using DH-485 protocol.
- send and receive ASCII characters, such as ASCII terminals, bar code readers, and printers.

When configured for system mode, the serial port supports DF1 protocol. Use system mode to communicate with other devices on the serial link. You can select the following DF1 modes:

- DF1 full-duplex: provides communication between an SLC 500 controller and other
- DF1 compatible devices. In point-to-point mode, the SLC 500 controller uses DF1 full-duplex protocol.
- DF1 half-duplex master: polls and transmits messages between the master and each remote node. In master mode, the SLC 500 controller uses DF1 half-duplex polled protocol.
- DF1 half-duplex slave: uses the controller as a slave station in a master/slave serial network. In slave mode, the SLC 500 controller uses DF1 half-duplex protocol.

DF1 radio modem: a hybrid between DF1 full-duplex and DF1 half-duplex, this protocol is optimized for use with radio modem networks.

Communication Cables

Catalog Number	Description
1761-CBLAS09	RJ45 to 6-Pin Phoenix Connector Communication Cable - This 9.5 m (31.2 ft) cable is used to connect the SLC 5/01, SLC 5/02, and SLC 5/03 processor RJ45 port to port 3 of the 1761-NET-AIC.
1747-CP3	SLC 5/03, 5/04, and 5/05 RS-232 Programmer Cable - This 3 m (10 ft) cable has two 9-pin DTE connectors and is used to connect the SLC processor RS-232 channel (channel 0) to a personal computer serial port.
1747-C11	Processor to Isolated Link Coupler Replacement Cable – This 304.8 mm (12 in) cable is used to connect the SLC 500 processor to the Isolated Link Coupler (1747-AIC).
1747-C13	Specialty Module to Isolated Link Coupler Cable - Use a 1747-C13 cable to connect a BASIC or KE module to an Isolated Link Coupler (1747-AIC). Also connects 1747-UIC RS-485 port to AIC or SLC RJ45 port.

Cable Connectivity Summary

For Connectivity Between These Devices		Preferred Cable Catalog Number	These Cables May Be Used
1746-A4, -A7, -A10, or -A13 Chassis	1746-A4, -A7, -A10, or -A13 Chassis	1746-C7 1746-C9 1746-C16	–
1747-DTAM-E Data Table Access Module	SLC 500 Processors (DH-485 Channel)	1747-C10	1747-C11 1747-C20
1746-AIC Isolated Link Coupler	SLC 500 Processors (DH-485 Channel)	1747-C11	1747-C10 1747-C13 1747-C20
1747-UIC USB to DH-485 Interface Converter 1747-KE DH-485/RS-232C Interface Module 1746-BAS BASIC Module	1747-AIC Isolated Link Coupler (J2 Port) SLC 500 Processors (DH-485 Channel)	1747-C13	1747-C10 1747-C11
1746-xx32 32-channel I/O Modules	1492-IFM40x	1492-CABLExH	–
SLC 5/03 Processor (RS-232 Channel 0) SLC 5/04 Processor (RS-232 Channel 0) SLC 5/05 Processor (RS-232 Channel 0)	Personal Computer Serial Port (9-Pin DTE)	1747-CP3	–
1746-I/O	1492-IFMxx Interface Modules	1492-CABLExx	–
1747-SN Remote I/O Scanner 1747-DCM Direct Communication Module 1747-ASB SLC Remote I/O Adapter Module	Remote I/O Network	Belden 9463	–
SLC 5/04 Processors (1747-L541, -542, -543)	Data Highway Plus	Belden 9463	–
1747-AIC Isolated Link Coupler 1761-NET-AIC Communication Interface 1784-PKTX(D) Communication Interface Card	1747-AIC Isolated Link Coupler	Belden 9842 Belden 3106A	–
1747-DPS1 and 1747-DPS2 Port Splitter	Rockwell Automation controllers, PanelView, PanelView Plus, VersaView, InView and Personal Computers	Uses available 1747, 1756, 1761, 2706 and 2711 cables.	Refer to Installation Instructions for the port splitter (1747-IN516).

Specialty Modules

Catalog Number	Backplane Current (mA) @ 5V	Backplane Current (mA) @ 24V	Watts per point	Thermal dissipation, min.	Thermal dissipation, max.
1746-BAS-T	150 mA	40 mA(1)	N/A	3.75 W	3.80 W
1746-BLM	110 mA	85 mA	N/A	5.00 W	5.00 W
1746-BTM	110 mA	85 mA	N/A	2.59 W	2.59 W
1746-HSCE	320 mA	0 mA	N/A	1.60 W	1.60 W
1746-HSCE2	250 mA	0 mA	N/A	1.25 W	1.25 W
1746-HSRV	300 mA	0 mA	N/A	1.50 W	1.50 W
1746-HSTP1	200 mA	90 mA	N/A	1.50 W	1.50 W
1746-INT4	110 mA	85 mA	N/A	1.26 W	1.26 W
1746-NR4	50 mA	50 mA	N/A	1.50 W	1.50 W
1746-NR8	100 mA	55 mA	N/A	1.82 W	1.82 W
1746-NT4	60 mA	40 mA	N/A	0.80 W	0.80 W
1746-NT8	120 mA	70 mA	N/A	2.28 W	2.28 W
1746-QS	1000 mA	200 mA	N/A	9.80 W	9.80 W
1746-QV	250 mA	0 mA	N/A	1.075 W	1.075 W

(1) When using the 1747-BAS or 1747-KE modules to supply power to an AIC, add 0.085 A (the current loading for the AIC) to the 1747-BAS or 1747-KE module's power supply loading value at 24V DC.

Communication Modules

Catalog Number	Backplane Current (mA) @ 5V	Backplane Current (mA) @ 24V	Watts per point	Thermal dissipation, min.	Thermal dissipation, max.
1747-ACN15	900 mA	0 mA	N/A	4.50 W	4.50 W
1747-ACNR15	900 mA	0 mA	N/A	4.50 W	4.50 W
1747-ASB	375 mA	0 mA	N/A	1.875 W	1.875 W
1747-BSN	800 mA	0 mA	N/A	4.00 W	4.00 W
1747-DCM	360 mA	0 mA	N/A	1.80 W	1.80 W
1747-KE	150 mA	40 mA(1)	N/A	3.75 W	3.80 W
1747-KFC15	640 mA	0 mA	N/A	3.20 W	3.20 W
1747-SCNR	900 mA	0 mA	N/A	4.50 W	4.50 W
1747-SDN	500 mA	-- mA	N/A	2.50 W	2.50 W
1747-SN	600 mA	0 mA	N/A	4.50 W	4.50 W

(1) When using the 1747-BAS or 1747-KE modules to supply power to an AIC, add 0.085 A (the current loading for the AIC) to the 1747-BAS or 1747-KE module's power supply loading value @ 24V DC.